CASE REPORTS

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Spontaneous Pneumopericardium

ROBERT S. BAUM, Major, USAF, MC
THOMAS G. WELCH, Major, USAF, MC, FACC
A. LAIRD BRYSON, Lt. Colonel, USAF, MC
Travis Air Force Base

PNEUMOPERICARDIUM is a rare condition usually associated with trauma, infection, fistula formation or iatrogenic disease states.[1-10] Spontaneous or idiopathic pneumopericardium is even more unusual and has been ascribed to rupture of a pulmonary alveolus with perivascular dissection back into the pericardium.[11-13] This report describes a 14-year-old boy with pneumopericardium following an episode of weight lifting. Clinical and radiologic features in spontaneous pneumopericardium are characteristic and the course is benign if the entity is looked for and recognized.

Report of a Case

A 14-year-old white boy entered David Grant United States Air Force Medical Center with a one-day history of dull substernal chest pain which worsened with deep breathing. He had been well until the day before admission and there was no history of fever, rash, joint pain or gastrointestinal discomfort. Two days before admission the patient had been lifting weights as part of a regular exercise program. Past history was unremarkable. There was no known exposure to tuberculosis.

From the Department of Medicine, Cardiology Service, David Grant USAF Medical Center, Travis AFB, California.

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Reprint requests to: Robert S. Baum, MD, 800 Clermont, Suite 200, Denver, CO 80220.

On physical examination, the patient was found to be alert, cooperative and in no acute distress. Blood pressure was 110/68 mm of mercury, pulse was 80 beats per minute, and respirations 20 per minute. No abnormalities of the head, ears, eyes, nose, throat or mouth were noted. A pectus carinatum deformity was seen on examination of the chest. The lungs were clear. There was a coarse systolic sound audible along the left sternal border. Heart sounds were normal and no murmurs were heard.

A roentgenogram of the chest showed the presence of pneumopericardium without any active pulmonary infiltrates or presence of pneumothorax (Figure 1). Electrocardiographic findings were within normal limits. The remainder of the laboratory workup gave results within normal limits, including a negative tuberculosis tine test, a negative cineesophagram and normal findings on a cardiac series with a barium filled esophagus.

The patient remained afebrile throughout the time in hospital. The chest pain resolved over the first 48 hours with conservative therapy. A repeat x-ray study of the chest showed no increase in the pneumopericardium. Findings on a follow-up roentgenogram one month later were normal and the patient was asymptomatic.

The patient had an additional episode of chest pain about a year later, again following an episode of weight lifting. There was no friction rub, electrocardiographic findings were normal and a roentgenogram of the chest again showed the presence of pneumopericardium. The pain resolved in two days with no therapy and a roentgenogram of the chest showed no abnormalities.

Discussion

Pneumopericardium was first described in 1844 by Bricheteau.[1] Since then, numerous cases have been reported and several common causes have been postulated. These include (1) trauma—secondary to perforation of the pericardium by a foreign body,[1-4] (2) infectious—secondary to gas-producing bacilli in the pericardial fluid,[1-4] (3) fistula formation—secondary to perforation of a neighboring viscus such as esophagus, stomach, liver abscess or bronchus[5,6] and (4) iatrogenic—secondary to pericardiectomy,[8] assisted

positive pressure ventilation in neonates,[8] esophagostomy[9] and pneumoencephalography.[10]

Although these causative factors were investigated in the case described here, no specific cause was identified. Nevertheless, the mechanism by which pneumopericardium developed in this case probably conformed to the observations of Macklin[11] in which alveolar rupture under sudden expiratory pressure (Valsalva) leads to dissection of air through the interstitial tissues of the lung and is guided along the sheath of the pulmonary vascular system, the mediastinum and then into the pericardial sac itself. Our patient had been weight lifting two days before clinical presentation and this could account for an alveolar rupture and subsequent dissection into the pericardium. Similarly, two cases of pneumopericardium in the immediate postpartum period have been attributed to Valsalva maneuver during labor leading to alveolar rupture,[12] and therefore conforming to Macklin's observations. In addition, this mechanism has also been reported to occur in acute asthma.[13]

Mauer and co-workers found in dogs that the increased intrapericardial pressure occurring with pneumopericardium may restrict ventricular filling. In our case there was no clinically evident hemodynamic embarrassment, probably due to the small amount of air present.

Symptoms of pneumopericardium may be absent or may include dyspnea, precordial chest pain, upper abdominal pain or syncope. Physical findings may be absent or may include associated subcutaneous emphysema, precordial hyperresonance, and a bubbling, crackling or crunching sound synchronous with the heart beat or a friction rub best heard in the left lateral decubitous position.

The feature, shown on x-ray studies, of a radiolucent space around the heart shadow surrounded by and defining a thin pericardial membrane, as seen in our patient, is characteristic and diag-

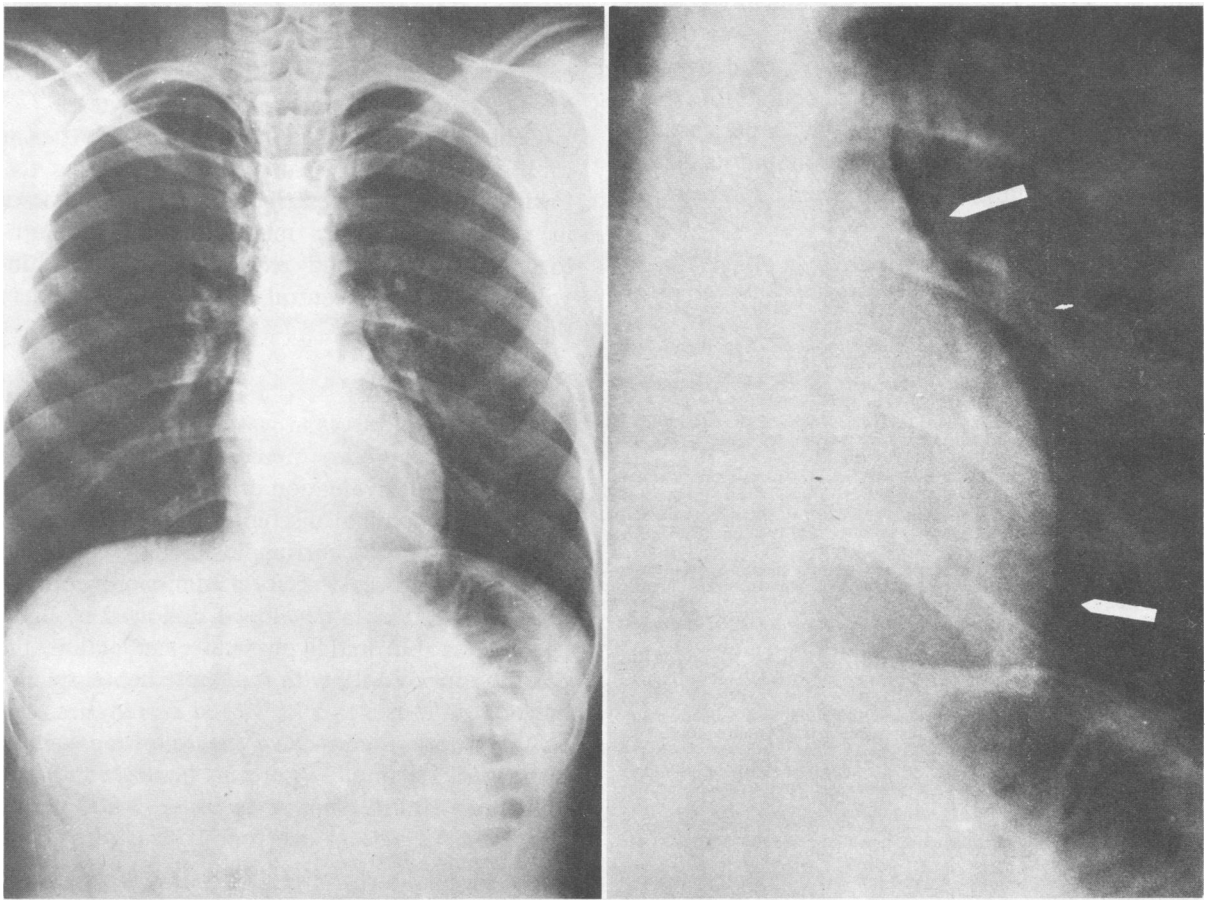

Figure 1.—Left, posteroanterior roentgenogram of the chest showing a radiolucent space along the left heart border surrounded by and defining a thin pericardial membrane. **Right,** enlargement showing the pericardial membrane (arrows).

nostic. The electrocardiogram is characteristically normal, and signs of pericardial injury are conspicuous by their absence, unless there is an infectious cause as in pyopneumopericardium.

The recognition of pneumopericardium in the presence of a history consistent with pericarditis, but with a normal electrocardiogram and characteristic findings on a roentgenogram of the chest, is important since the management and prognosis is dependent upon the underlying disease state as mentioned above. In the absence of any obvious underlying cause, a history of recent exertion, especially that involving a Valsalva maneuver, should be sought. Mistaking this presentation for pericarditis would lead to an error in therapy, since such cases of spontaneous or idiopathic pneumopericardium are usually associated with small amounts of air and have an excellent prognosis with conservative management.

Summary

Pneumopericardium is an uncommon entity with numerous possible causes. Clinically it often presents with pericarditis. Its spontaneous occurrence following prolonged Valsalva maneuvers is associated with a benign clinical course. In otherwise healthy patients presenting with pericarditis, proper recognition of this condition and its classic radiologic findings may prevent unnecessary therapy.

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Histiocytic Medullary Reticulosis with Central Nervous System Involvement

S. ROBERT FREEDMAN, MD
San Francisco

HISTIOCYTIC MEDULLARY RETICULOSIS (HMR) is a malignant disorder of proliferating histiocytes characterized by a rapidly progressive and fatal course of fever, wasting, generalized lymphadenopathy, hepatosplenomegaly and pancytopenia. It was first described in 1939 by Scott and Robb-Smith,[1] who distinguished it from other malignant lymphoreticular diseases by characteristic morphologic features in lymph node and spleen. This entity has been further characterized immunologically as a malignant proliferation of the M-cell lineage (monocyte-macrophage-histiocyte).[2]

Central nervous system involvement in HMR is rare,[3] reported only in isolated cases.[4] The following case report describes a patient with HMR in whom antemortem manifestations of neurologic dysfunction and extensive pathologic involvement of the central nervous system were present.

Report of a Case

A 44-year-old woman was admitted to hospital at Santa Clara Valley Medical Center in October of 1972 for the evaluation of progressive lethargy, anorexia, abdominal discomfort, chills and fever, and weight loss occurring insidiously over four months. Four weeks before admission, episodic temporal headaches developed, followed by lightheadedness. On initial physical examination, the patient appeared ill, with moderate hepatosplenomegaly, mild ascites and wasted extremities.

Laboratory studies gave the following values: hematocrit reading, 36 percent; hemoglobin, 11.1 grams per 100 ml; leukocyte count, 3,800 per cu mm, with 51 percent neutrophils, 4 percent band

From the Department of Pathology, Santa Clara Valley Medical Center, San Jose.
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Reprint requests to: S. Robert Freedman, MD, Department of Pathology and Laboratory Medicine, Mount Zion Hospital and Medical Center, P.O. Box 7921, San Francisco, CA 94120.